Oct. 27, 1936. J. P. PETITMERMET 2,058,620

YARN CONSTRUCTION

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Fig. 1. Fig. 2.

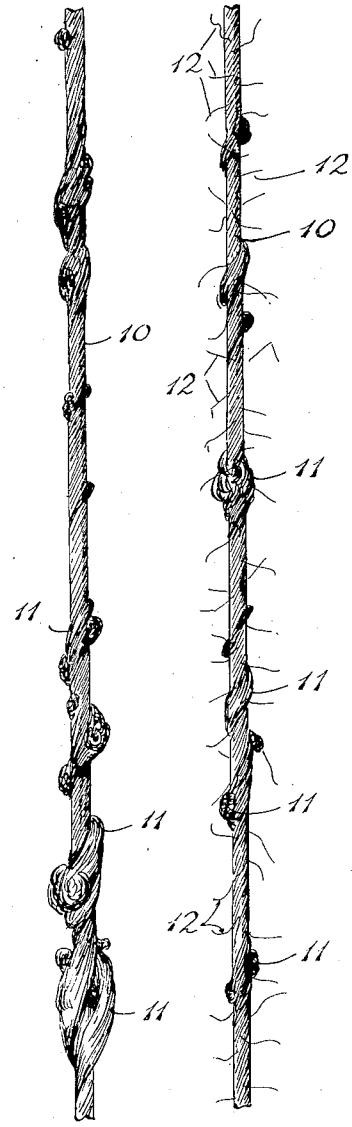
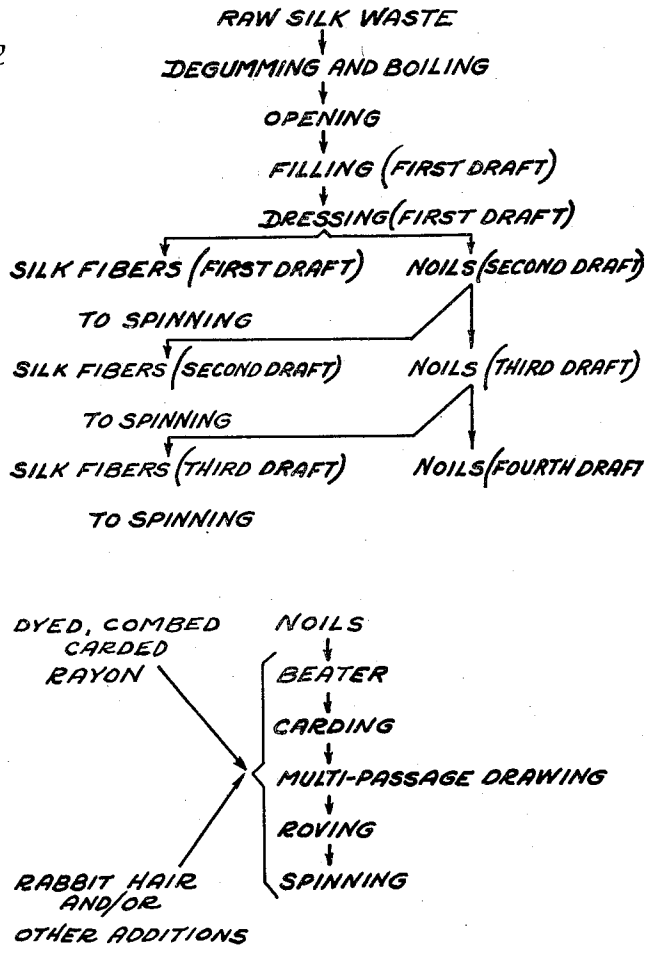


Fig. 3.



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YARN CONSTRUCTION

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2 Claims. (Cl. 117—52)

The present invention relates to a novel yarn construction and method of making the same, and it particularly relates to composite nib or nub yarn constructions.

It is among the objects of the present invention to provide an improved composite yarn construction by spinning processes, which yarn will have a nub or nib appearance and at the same time will be of undiminished strength and of low cost to manufacture.

Another object is to provide an improved composite nub or nib yarn construction which may be inexpensively manufactured by standard machinery now in use for making spun silk yarns, which yarn will be of enhanced appearance and may be readily woven or knitted to give fabrics of novel effect and characteristics.

Other objects will appear during the course of the following specification.

In manufacturing the novel yarn of the present application it has been found most satisfactory to combine together by carding, drawing, roving and/or spinning operations, silk noils and cellulosic or other fibers, preferably taking the form of rayon waste. The noils are preferably obtained by the combing operations incidental to the manufacture of the spun silk.

In lieu of or in addition to the rayon strands, there also may be combined in the yarn, wool fibers, spun silk fibers, natural silk fibers, mohair fibers, rabbit hair, metal fibers and so forth.

In lieu of or in addition to the silk noils, noils made of rayon fibers or of wool or worsted fibers may also be combined into the yarn construction.

However, in the preferred yarn construction according to the present invention the rayon fibers and the silk noils constitute a major portion of the yarn, preferably from 60% to 100% with the rayon fibers being used in the quantity from 2 to 6 times the amount of the silk noils to achieve the desired effect.

In the preferred yarn construction one or more slivers, rovings or strands of rayon fibers may be utilized either in bleached white condition or dyed in one or more different colors. The rayon, if dyed, is preferably dyed before combination into the yarn. The rayon fibers are preferably cut up into about 4" lengths and they may vary from 1½ to 10 denier with a preferred range of from 2 to 5 denier. These rayon fibers constitute the base of the yarn in the preferred form and in certain desired constructions they constitute from 60 to 90% of the yarn construction.

The silk noils, nibs or nubs are the curled up, coiled or tangled silk fibers, which are combed out of silk waste in making spun silk, and the noils are preferably so selected that there will be extending from each of the tangles or coils, a substantial quantity of relatively long fibers which may be spun in with the rayon fibers above referred to to form a unitary base construction in which the tangles, coils or curls will project out of the twisted base fibers and give a mottled or slubby appearance to the resultant yarns.

This nib or nub stock is preferably used in an amount varying from ¼ to ⅔ of the rayon base and is used in sufficient quantity to give a distribution of about between 2 to 10 nubs per inch of yarn construction.

The straight fibers which extend outwardly from the coils, tangles or nubs, preferably vary from 2 to 4" in length so that they may be most satisfactorily combined with rayon or base fibers which also preferably range from 2" to 5" in length.

With the main base of rayon fibers and the subsidiary base of silk noils there may also be combined rabbit hair, angora, mohair, goat hair, spun silk, worsted and so forth.

Where rabbit hair is utilized it is preferable to use short hairs of 1" to 2" in length without felting properties, which are preferably selected so that they will project in substantial quantities from the yarn construction.

The rabbit hair is used in the form of white fibers.

Preferably in combining the rabbit hair fibers those fibers are selected which have relatively thin ends spun into the yarn with relatively thick ends projecting therefrom.

In these various combinations above stated a single color of rayon base fibers may be utilized or two or three colors may be utilized and the same is also true of the silk noils, and the colors may be blended together very thoroughly by running them through a continued drawing process before the roving and spinning operations, so that they will more or less be indistinguishable.

On the other hand the various colored fibers may be subjected to a very limited drawing so that the variegated colors will be distinguishable and give the appearance to the resultant yarn as if the yarn were spun from fibers of various colors.

Although the nub or nib yarns according to the present invention are preferably combined in the drawing operation and preferably at the end of the drawing operation, they also may be readily

combined in the course of the roving operation, or less desirably in the spinning operation.

Where the various fibers are combined together in the roving or spinning operations, it is possible by feeding one of the fibrous combinations at a greater speed than the other, to more or less wind one of the rovings, yarns or threads around the other to form a composite yarn construction in which a crinkled or creped appearance is obtained of the yarn itself due to the fact that one yarn will lay in more or less crinkled fashion around and encircling said other yarn.

In spinning or roving the nib or nub yarns according to the present application preferably from 2 to 5 strands are combined, although the range may be extended up to 10 or 12 strands, and in the preliminary drawing operation a similar number of strands are also combined together to form the strand which is subjected to the roving operation.

In addition to the various materials above stated it is possible to utilize thin flexible metal strips or fibers, acetate scrap, or fine flat pieces of sheet hydrated cellulosic materials which may be combined with the nib yarns either in the carding or drawing operations, with the result that these strips or threads will be partly entangled in the yarn and partly projecting outside the yarn to give desirable filling.

Although straight short silk fibers may be utilized to make the composite nib or nub yarns of the present application, the third to fourth draft silk being combined with the third to fifth run of noils or with various combinations thereof, it has been found that with a rayon base and with silk noils of the character described above a particularly satisfactory yarn construction is obtained with a softer feel, a livelier appearance and an increased strength and that a yarn is produced which is more satisfactorily adapted to knitting and weaving operations.

Moreover, knitted or woven fabrics are much more satisfactory from the viewpoint of strength, color characteristics and artistic effect when produced from the preferred yarn of the present application.

There will now be described one preferred method of making a silk noil which may be employed in connection with the yarn construction of the present application which is illustrated upon the accompanyng drawing, in which:

Figure 1 is an enlarged view of the yarn construction showing the rayon and base yarn twisted together at 10 with the silk nibs or nubs 11 projecting, said silk nubs or nibs having strands twisted into the base 10.

In Figure 2 the rayon base 10 not only carries the nibs or nubs 11, but also the rabbit hairs 12, which may be replaced or enhanced with other projecting strands, metal fibers or tinsel, acetate fibers or strips, scrap sheet regenerated cellulose and so forth.

In Figure 3 is shown a diagrammatic chart of some of the operations which may be utilized to produce the spun silk yarn of the present application.

As indicated in this chart the noils are produced from raw silk waste. The raw silk waste may include or be composed of short broken fibers of natural silk in gum, pierced double incomplete or weak cocoons, frisons, frisonets, bassinets, pelettes, broken ends which result from the winding, throwing, wearing and knitting of silk and so forth.

The raw silk waste is then degummed by subjecting it to treatment in a boiling soap solution, the raw silk waste preferably being placed in some form of a container such as a coarse net bag to enable handling thereof, while the gum is being boiled off.

The silk may be dyed at this point but preferably it is first separated into silk fibers and noils before such dyeing operations are carried out.

After degumming and boiling and drying, the silk is then subjected to opening and filling operations, and finally the silk is separated by a series of combing operations which may produce from 1 to 4 drafts of silk and from 1 to 5 drafts of noils.

The opening, dressing and combing operations are performed by feeding the fibers against the revolving cylinders or drums with needle-like teeth which may be straight, curved or bent, which teeth tend to separate and straighten the fibers. In each successive process, the successive draft silks will be of shorter fiber length, while the resultant noils will contain shorter and shorter lengths of fiber.

To make the yarn desired of the present application it is possible to use any draft noils although it is preferred to use that draft of noils, which will give satisfactory length fibers extending from and connected to the tangles or noils, as the case may be.

The first, second, third or fourth spun silk may also be incorporated with the final noils of the present application, but in the preferred construction the yarn is provided, for the major part, with a base of rayon fibers.

The rayon base strands are preferably subjected to substantially the same preliminary treatments as the noils.

The noils and the rayon base (and also the spun silk, worsted or other fibrous materials, if any such additions are employed) are preferably dyed or made up in variegated colors before being subjected to the carding operation, which prepared the noils and rayon fibers in the form of slivers.

The various slivers from the carding operation are then combined with other slivers and subjected to successive drawing operation, anywhere from 3 to 7 to 10 passes being employed. The fibers may also be subjected to successive carding operations prior to or in addition to the drawing operation.

Although the various slivers of different colored rayon and/or noils may be combined together and run together for the entire drawing operation, for the purpose of the present invention it is generally preferred to combine these slivers together at the last drawing step. Where the slivers are combined together in the first drawing operation the colors will be blended closely together so as to be substantially indistinguishable, while in the case of the present invention it is generally preferred to leave the different colors more or less distinguishable from each other to give a variegated multi-colored effect. The combined slivers are then subjected to a roving operation and finally to a spinning operation, and if desired other slivers or yarns may be combined during the spinning operation to obtain suitable variegated yarn effects.

The roving operation gives a relatively slight twist while the spinning operation gives a relatively high twist, both operations simultaneously drawing out and decreasing the diameter of the twisted strand.

The resulting yarn produced is of high tensile

strength, has an attractive variegated effect, particularly when woven or knitted up into fabrics and if desired may be dyed, when so dyed due to its composite construction there will result unusual colored effects. The yarn produced also has a particularly soft feel and may be most satisfactorily employed in either knitting or weaving machines.

I claim:

1. A composite yarn formed of staple cut length rayon fibers spinnable throughout their entire length and fibres of noils partly tangled or coiled and nonspinnable and partly straight and spinnable the latter being spun in with the rayon.

2. A composite yarn formed of staple cut length rayon fibres spinnable throughout their entire length and fibres of silk noils partly tangled or coiled and nonspinnable and partly straight and spinnable the latter being spun in with the rayon, said staple cut length rayon fibres varying from two to five inches in length and said noils and said fibres being differently colored.

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